Training Guidelines for the Marmotte Granfondo Alpes

Revised and updated December 2024 (V4)

The Marmotte Granfondo Alpes is the best known, the oldest and the toughest of the mass-participation French sportives. Because of its difficulty, the iconic reputation of the climbs, and the prestigious finish in Alpe d'Huez, all sportive riders dream of tackling it at least once. To finish the Marmotte is an exploit to be proud of: many hundreds of riders abandon every year, more if the weather is bad.

The event attracts the best sportive and GranFondo riders from the world over, and competition is fierce. Only the most dedicated and best-trained cyclists can hope to achieve a "Gold" certificate, let alone to finish anywhere near the podium.

1. What does it take to do well at this event?

Depending on your level, it will take you between 6h30 and 14 hours to complete the 175km and 5,000m of climbing between Bourg d'Oisans and Alpe d'Huez. This is a challenging ride by any standards, and such an event should be prepared over several years. If you are relatively new to cycling, we recommend you accumulate experience riding shorter and less challenging events before tackling the Marmotte. It's best to ride a minimum of 5,000km with at least 50,000m+ of climbing in the year before: the majority of participants have many years of experience and ride more than twice these amounts.

So how best to prepare for the Marmotte?

To answer this let's take a look at the demands of the event. The Marmotte includes four major climbs, two long descents (the first untimed) and two long valleys, the first of which is a false flat climb and the second is a false flat descent.

Profile of the Marmotte Alps

Read here for more details: Course analysis for the Marmotte Granfondo Alpes.

The weather is a major imponderable, and can turn a tough event into a terrible ordeal if you are unprepared or lack the right clothes. Extremes of heat can be as challenging for some as heavy rain, sleet or even snow and the resulting risk of hypothermia for others. Even if it doesn't rain, you may experience temperatures varying from ~0°C to 30°C throughout the day.

The riders who perform best at the Marmotte have the following characteristics:

Physiological

- A high power-to-weight ratio for the climbs
- Excellent aerobic endurance (6h30-14h total cycling; multiple long climbs)
- A high capacity to burn fat instead of carbohydrate while climbing steadily
- Good short-term muscular endurance (short, hard efforts to stay with groups in the valleys)

- The ability to recover quickly between efforts

Psychological

- The ability to maintain focus, motivation and lucidity for the time it takes to finish, even when severely fatigued
- The self-discipline to stick to one's optimum pace on the climbs (and let others go… perhaps to see them again later!)
- The ability to tolerate long periods of pain and discomfort
- The ability to stay positive and deal with setbacks and negative thoughts

Technical

- Excellent energy-efficient climbing skills, on long climbs and varied gradients
- Excellent descending and cornering skills
- Very good bunch riding skills
- The ability to eat and drink while climbing and while riding in a peloton
- The ability to change clothing or at least to adjust for temperature while riding

Tactical

- The ability to identify and stick to the optimum pace on long climbs
- The ability to identify when to push harder and when to conserve energy

It is certainly possible to reach the finish line of the Marmotte without being "excellent" on all these criteria. It will, however, take longer and feel harder. Each criterion is important and your particular combination will determine your overall performance, or indeed whether or not you finish.

Before working on your personal training plan, take the time to analyse your current abilities against this list to identify your strengths and limiters.

To obtain your best performance you should not only continue to develop your strengths, but also to work on your limiters, at least to the point where they no longer handicap you.

As an example, if descending is a limiter for you, you might easily lose 2-3 minutes on each descent. The cumulative effect however will be much worse because you will lose the people you were riding with and drop back at least one group each time (Glandon, Galibier, Lautaret…). The result could easily add up to a 20 or 30 minute deficit by the end. This is a shame, because descending faster is a skill that can be learned and has almost no extra energy cost!

Benchmarks

The following table gives benchmark data for 3 riders, who finished respectively around the 50th place, around the 1500th place and just inside the time limit.

Result	Range of VAM[1] (Vertical Ascent Metres/hour)	Average W/kg (climbs during Marmotte)	Range of % FTP[2] (climbs during Marmotte)	FTP/kg
45	970 – 1,100	3.4 – 3.9	80% - 92%	4.3
1443	690 – 870	2.1 – 2.7	61% - 79%	3.4
Finisher	530 – 600	1.6 – 1.9	66% - 78%	2.4

[1] VAM is an extremely useful measure of performance on the climbs, especially if you don't have a power meter. It is easily calculated (vertical metres climbed per hour) and reported by numerous apps such as Strava.

[2] FTP is Functional Threshold Power, the average power you can sustain for about one hour.

The ranges given for VAM and W/kg are the highest and lowest average numbers from the 4 major climbs (Glandon, Télégraphe, Galibier and Alpe d'Huez). The highest was always on the Glandon and the lowest always on the Alpe.

Beware: these data concern only 3 riders. Other riders with exactly the same performance on the climbs might have obtained slightly better (or worse) results, depending on the accuracy of their power meter data, their descending ability and the time they spent stopped relative to the three riders mentioned here. Nevertheless, the performance data provides a useful reference. For example, if your ambition is to finish in the top 50, you will need to produce numbers very similar to the first rider. Equally, if you are unable to complete the 4 climbs at an average VAM higher than about 550, you will need to descend fast and stop very little if you are to finish within the time limit.

2. Your Training Plan: Principles

The best training plan for you is one that has been designed with your unique strengths, limiters, objectives, context and constraints in mind, and is constantly adapted for you when things change (as they inevitably do).

Someone likely to finish in the top 500 or in less than 7h15 needs a very different plan to someone who will find it hard to finish before the cut-off. The closer to the front, the more like a race; the closer to the back, the more it becomes a pure endurance ride. The training is not the same.

A generic plan will thus be sub-optimum at best and potentially damaging. This is why we are not providing a generic plan. The "plan" we propose below is in fact a framework and a set of guidelines for you to adopt and adapt as appropriate. Our goal is to give you the means to think carefully about the process and take responsibility for your own preparation.

HOWEVER, this is not a book and we cannot possible explain here all the nuances and individual variations inherent in the training process. We therefore strongly encourage you to use this document as an aide-memoire to **what** might be important, but then either to do your own research into **how** to apply it, or to find a coach to help you.

The key principles behind a strong training plan for the Marmotte are:

1. **Your commitment to make the Marmotte a priority.** This should go without saying, but if you want to ride well at the Marmotte, you must commit to a serious effort of preparation. Our plan assumes you will train for 8-12h per week on average through the early part, rising to 15h per week on average during the final two months. It may make sense to negotiate this with your partner and family from the outset.
2. **Be consistent.** This is the single most important success factor. Of course your training load will vary from one week to the next but these variations should be deliberate in order to create overload and then recovery and super-compensation. If you are unable to train normally for a period you should keep this to a minimum and find ways to compensate (e.g. leg & core strength workouts, climbing stairs, walking, jogging, swimming…)
3. **Build a strong aerobic base**, so you can ride steadily for several hours without having to ease off. To do this, we recommend you train predominantly at low intensity, below LT1[3], the point at which the lactate concentration in your blood starts to increase above the baseline. This is quite likely to be much lower than the current level at which you train. It's important to understand that training at this low intensity provides the endurance adaptations you need without adding unnecessary fatigue, thus allowing you to train more.

[3] Ideally, you should determine LT1 via a lactate test. Failing this, you can estimate it by paying very careful attention to your breathing while starting at a very low intensity and increasing slowly. Your LT1 will be the point where you first feel the need to start breathing more deeply. For the majority of people, LT1 will be in the range 60-65% of FTP or 60-65% of HRmax

4. **Develop your fat-burning capacity,** to conserve your glycogen stocks during the long climbs and thus your ability to climb hard for longer. Metabolic adaptation is a real differentiator at the Marmotte (as it is at Ironman™ triathlons). It is very difficult to consume enough carbohydrate during the ride to fuel it adequately and therefore the more you can use your fat stores the better you will perform. It is the combination of a strong aerobic base with the metabolic ability to burn a high proportion of fat at race pace that results in high *durability* (allowing you to climb Alpe d'Huez at a comparable intensity to the previous three climbs).
5. **Build your pain tolerance.** Endurance is "*the struggle to continue against a mounting desire to stop*"[4]. For many people this struggle begins in earnest somewhere on the col du Galibier, when there are still around 60km left to ride and 2,000m to climb. There's no escaping the fact that the Marmotte is going to make you suffer. The better you can train yourself to tolerate the pain and discomfort as it becomes more and more pressing, the more likely you are to finish.
6. **From April onwards, do as much climbing as possible**. In the last 3-4 weeks you should be doing at least 3,000m in a single ride. Vary the intensity on your climbs: if you attack every climb in your training at fast tempo (let alone as hard as you can), you will build mainly fatigue, not fitness. As you get closer to the event you should do **some** of the climbs at (your) race pace, especially towards the end of your rides. If you live in a flat area your options are (1) to do hill repeats on whatever you can find nearby; (2) to travel to find some climbs; (3) to use a smart trainer linked to an app which will simulate the climbs for you.
7. **Build short-term muscular endurance**, which is the ability to ride above threshold for short periods in order to close gaps, stay with a group and power up short climbs. The stronger a rider you are, and therefore the closer to the front and the more you are racing (as opposed to attempting to finish) the more important this is.
8. **Increase the load progressively, over a period of 2-3 weeks, then recover,** to allow your body to adapt and get stronger. Remember, hard training actually breaks you down and makes you weaker! You only get stronger when your body has the time to recover, adapt and rebuild. There should be a big difference between your hardest and your easiest training weeks.
9. **Monitor your readiness to take on high load**. The best way to do this is via measuring your RHR (Resting Heart Rate) and HRV (Heart Rate Variability), which provide insights to the state of your parasympathetic nervous system and therefore the stress you are under. Research has shown that training when you are stressed (high RHR, low HRV) provides little or no benefit and may even be harmful. We recommend monitoring your RHR and HRV every morning as soon as you wake up. If RHR is significantly higher than normal and/or HRV significantly lower, train easy or not at all. For more on this read here.
10. **Include exercises to develop your technical skills**, and not only physiological capacity, because bike racing is not only about FTP (Functional Threshold Power, or the power you can sustain for about one hour). These exercises might include low-cadence while climbing, high-cadence while riding on the flat, cornering, riding in a group, taking clothes on and off while riding, etc.

Our framework training plan begins on November 1st. This is the traditional start to a new cycling season, and gives you eight months (35 weeks) to prepare for the event.

A key assumption is that you will continue to ride regularly on the roads throughout the period. If this is not possible, you will have to compensate by doing long rides on a turbo trainer and ideally by

[4] Samuele Marcora, quoted by Alex Hutchinson in his book *Endure* (2018)

joining a training camp in the early part of the year in a warm-weather location such as southern Spain or Portugal, Mallorca or the Canary Islands.

To finalise your preparations, plan a training camp in the mountains in May or June and ride as much as possible in hot weather to acclimatise. Alpine Cols is running several coaching camps in 2025, all of which have a strong focus on improving skills and technique and are intended to help you prepare for sportives and GranFondos such as the Marmotte. Alpine Cols coaching camps in 2025

3. Your Training Plan: Overview and Structure

Our suggested framework includes three phases: **Preparation**, **Pre-Competition** and **Competition**. Each phase is then broken down into 4-week cycles including 3 load weeks and 1 recovery week, with a target training load for each week. If you are over 50, consider adopting a 3-week cycle of 2 load weeks and 1 recovery week.

It's important to understand that such a structure is essentially arbitrary and takes no account of the total stress you will be under (life stress + training stress) on any particular day.

Current best practice is to monitor readiness to train, using a combination of daily HRV (Heart Rate Variability) measurements with perceptions of fatigue and muscle soreness, and to adjust the plan accordingly. If you feel very tired, have sore muscles and your HRV is below the normal range, you should either take a very easy day or not train at all until you have recovered. Research has shown that training when you are stressed (low HRV) provides little or no benefit and may even be harmful. Read here for more on how to use HRV to guide your training.

Remember that hard training breaks you down: you only get stronger during recovery!

In terms of intensity distribution, we recommend that the Preparation phase be **Polarised** (80% low / 20% high intensity, or even 90% low / 10% high) and the Pre-Competition phase be **Pyramidal** (70% low / 20% medium / 10% high).

Download the training plan.

4. Your Training Plan: by Period

4.1 Preparation Phase: November-April (35-15 weeks to go)

This covers the period from November through March. The key objectives here are to accustom your body to training 8-12 hours per week, to build a strong aerobic base, and to use a limited number of HIT interval sessions to develop short-term muscular endurance.

The training intensity distribution during this phase should be **Polarised**, meaning 80%-90% of your training should be at low intensity and only 10%-20% at high intensity. The percentage breakdown is calculated on the basis of the number of hours in the workout, not the actual time spent at high intensity. Thus, a typical high-intensity interval session will last an hour (and should be counted as such) even if the actual high-intensity time doesn't exceed 10-20 minutes. If you add 5-10 sprints to a 4-hour low-intensity outing, count 3 hours at low intensity and 1 hour at high intensity.

You should completely avoid training at medium intensity (in Z3, often called Tempo or in low Z4, often called Sweet-Spot), because at this time of year it creates too much fatigue for too little benefit. In practice this means that, for most people, only one ride per week should include a significant amount of high intensity work.

4.1.1 Preparation Phase, on the bike training

1. **Aerobic endurance**: progressing to 6h rides at intensity below LT1, the point at which the lactate concentration in your blood starts to increase above the baseline (usually less than 60-

65% of your HRmax or FTP). If in doubt, err on the cautious side. The rides should FEEL slow (and only become tiring after 3h or more). Aerobic endurance is by far the most important quality you need to build and you should spend ~90% of your training on this.

Riding slowly may sound incredibly boring and it certainly takes some adaptation, not least in your attitude and mindset. Read here for tips on how to help the time pass on long slow rides.

If you are unable to ride outside you will have to do long sessions on your turbo trainer. Read here for suggestions on how to make these more tolerable.

2. **Fat-burning capacity:** Progress towards this by limiting your intake of refined sugar and high glycaemic-index carbohydrates, both on and of the bike. Do one long low-intensity ride per week partially or fully fasted, and only begin to eat on the bike after the first two hours. Don't attempt to do 3h+ plus with no carb intake: this will not be beneficial.

   A good overall macro-nutrient split in terms of the total kCal you consume overall during heavy training has been shown to be 48% from carbohydrate, 24% from protein and 28% from fat[5]. Obviously each food item should be as high quality and as natural as possible. Avoid processed and especially industrial foods.

   Finally, remember to adjust your food intake to your energy expenditure: eat more on high load days and during high load weeks, and cut back, especially the carbs, during easy days and recovery weeks. Keep an eye on the scales to be sure that any weight loss is slow and progressive: the priority at this stage is to fuel your training! Read here for more on nutrition while training.

3. **Short-term muscular endurance**: multiple 4'-8' efforts, initially in Zone3 then increasing progressively to Zone5; and/or 1'-2' efforts initially in Zone4 increasing progressively to Zone6. High short-term muscular endurance is essential for staying with the other riders at your level during the first hour and staying in a peloton in the valleys. Do some of these efforts at low cadence. No more than one per week, and none during the recovery weeks.

4. **Technical limiters**: e.g. bunch riding, descending, cornering, etc. Take every opportunity on your long rides to practice technical skills. If you are not a confident descender, consider joining a training camp in the mountains with a coaching team qualified to teach you to descend fast and safely. (This is always a key focus on all Alpine Cols coaching camps).

4.1.2 Preparation Phase, off the bike training

You may not be used to off-the-bike training. Nevertheless, it can have a significant impact on your performance. To cycle faster, you need to push harder on the pedals, which means you need not only stronger leg muscles but also greater core strength to stabilise and channel the extra force. The best way to strengthen your muscles is off the bike, using appropriate exercises and good technique.

1. **Strength and conditioning**: one or two sessions per week, ideally guided by a Strength & Conditioning coach with experience in cycling. The goal at this time of year is to increase the strength of your leg and core muscles.

   If you are new to this, err on the side of caution to limit the risk of injury. Good exercises to begin with include squats, lunges, planks, bridges and roll-downs. All of these require correct technique to be beneficial. Once you've learned good technique you can do this at home.

[5] See, for example, https://alancouzens.com/blog/improving_fat_burning2.html

2. **Flexibility and stretching**: two to three 20' sessions per week. Pilates or Yoga can be extremely beneficial. Learning correct technique is vital so choose a practitioner who knows cycling and only takes small groups (or better still individuals).
3. **Complement** occasionally with other sports: walking, running, swimming, etc. If cycling is your only sport you risk building up imbalances and soft tissue problems over time.

4.2. Pre-Competition Phase: April to June. (15-2 weeks to go)

This phase includes the period from April to mid-June. The key objectives during the Pre-Competition phase are to increase the training load to 15 hours per week or more, to reinforce your aerobic base, to improve your climbing at race pace and to improve your general race readiness.

The training intensity distribution should now switch to **Pyramidal**. You should still train for 70% of the time at low intensity but you should now introduce medium intensity training (Z3 tempo and low Z4 sweet-spot) for 20% of the time, while maintaining 10% at high intensity. Your training thus becomes more race-specific as you get closer to the event. In practice it means adding tempo or sweet-spot sessions to one or two rides per week while maintaining one ride per week focused on high intensity work.

4.2.1 Pre-Competition Phase, on the bike training

1. **Aerobic endurance**: continuing long low-intensity rides, progressing to an 8h ride by mid-June, with as much climbing as possible. Either do these long rides alone or with an understanding training partner willing to stick to the low intensity.
2. **Fat-burning capacity:** continue along the lines laid out for the Preparation phase. It is important to keep your overall macro-nutrient balance close to the recommended split (based on kCal): 48% from carbohydrate, 24% from protein and 28% from fat.

   It is equally important to ensure that you are fuelling your training adequately as well as not over-eating during recovery weeks. Keep a close eye on the kCal expended per ride (as reported by apps such as Strava) to guide how much you should eat.

   Read here for more on nutrition while training.
3. **Threshold**: multiple 10'-30' efforts, first in Zone3, then in Zone4 to develop your ability to climb at race pace. No need to structure too much: just make all the climbs in Zone3 or Zone4 on a 2-4h ride. Try to push a bit harder on the final climb. No more than two per week, less if overly fatigued.
4. **Sportive or club ride**: twice per month in May or June, either ride a sportive or join a fast club ride in order to sharpen your reflexes and (re-)accustom yourself to race pace.
5. **Recovery**: short rides, 60-90 minutes, strictly in Zone 1. Make the recovery EASY. If the hardest training has pushed you close to your limit, then recovery must be easier than normal, otherwise you will overtrain and lose the benefit.
6. **Test different nutritional and equipment choices** so that come race day you know exactly what works – and what doesn't work. Practice changing clothing and adapting to different temperatures while riding. Get used to carrying two spare inner tubes and CO2 cartridges, or a pump.

4.2.2 Pre-Competition Phase, off the bike training

1. **Strength and conditioning**: one or two sessions per week, ideally guided by a Strength & Conditioning coach with experience in cycling. The goal during this period is to maintain the strength of your leg and core muscles. Cycling does not do this adequately.

2. **Flexibility and stretching**: as in the previous phase it is vital to maintain these sessions to keep your body flexible. Do two to three 20' sessions per week.
3. **Other activities**: optional, as desired. We recommend an occasional swim, a 1-2h walk or perhaps a light jog.

4.2.3 General

1. **Maximise your sleep**. This is essential for recovery and adaptation. You should aim at a minimum of 7h per night, and try to wake up naturally (without an alarm-clock). Banish all screens from the bedroom.
2. **Minimum travel, minimum stress**: the less you add to the stress on your body, the better off you will be. Look for psychological coping strategies to reduce the impact of the most stressful events that can't be avoided.

4.3. Competition Phase: taper for the last 2 weeks

This covers the final one to two weeks before the event. The key objective is to eliminate fatigue without losing fitness. You want to arrive on the start line the fittest you have ever been, but also super-fresh and thus able to go the distance. The longer the event, the longer the taper: if you would normally taper for 5-7 days prior to a typical event, taper for 10-14 days for the Marmotte.

4.3.1 Competition Phase, on the bike

Progressively reduce your training volume by at least 50%. For example, if you have been riding 15h per week, you might bring it down to 10h in the second-to-last week and no more than 7h in the final week. If in doubt, do less. It's too late to make any difference to your fitness and it's far more important to eliminate the accumulated fatigue.

Ideally, you should arrive in Alpe d'Huez at least 2-3 days before the start. The earlier, the better. Do a couple of short rides to spin the legs but nothing strenuous. Some people find it beneficial to do a few short efforts at high intensity on the day before a race, e.g. 5'-10' in Zone4, 1'-2' in Zone5, but this doesn't work for everybody.

4.3.2 Competition Phase, off the bike

The need for sleep, good quality nutrition and minimum stress are even more acute during the taper. The advice is the same as for the Pre-Competition Phase. The better you can plan to sleep well, eat well and avoid stress, the better off you will be.

Download the training plan. Remember, it is up to you to adapt it depending on your personal situation.

5. SUPPORT FROM ALPINE COLS

All of our coaches have ridden the Marmotte multiple times and know the challenge extremely well. We can help you prepare in two complementary ways:

1. Sign up for a six-month coaching agreement to receive individual day-to-day coaching and one-on-one advice;
2. Join a one-week coaching camp to benefit from a big block of training as well as one-on-one coaching on your technical skills and of course plenty of advice and tips for your preparation and the event itself. The coaches ride with you on their own bikes and use both observational feedback in real time and videos to help you improve.

Contact Alpine Cols